food ran the risk of being spilt or spoilt if no clean hole was cut through the leathery covering does not seem hazardous. It is evident that premaxillary teeth never would be capable of cutting a neat hole in a leathery bag containing semifluid material.

(4) That the swallowing of some semifluid material was likely to be accompanied by a rapid fore-and-aft movement of the head is not at all surprising. As Osborn pointed out, the existence of such movements in *Struthiomimus* is rendered probable by the structure of the cervical vertebræ.

(5) Since remains of *Struthiomimus* occur frequently in seashore deposits, we can assume that it was frequently to be met with on sandy beaches, where it could rush along on the sand and avoid muddy regions.

Summing up, we may assume that *Struthiomimus* frequently found its food in the sand along the shore, uncovered it with its hind legs, lifted it with its hands, opened the leathery covering with the beak, and swallowed the semifluid contents, jerking its head while swallowing. So *Struthiomimus* seems to have been an egg-devouring Dinosaur of the very worst sort, frequently pursued by the animals whose nests he robbed.

That reptile eggs were abundant during all the Mesozoic period, and that they were also then especially abundant on dry and sandy beaches, is beyond doubt. As to the apparently curious feature of a carnivorous Dinosaur becoming adapted to the eating of eggs, this is paralleled in the Varanidæ and the snake *Dasypeltis*.

To convey to the general reader an idea of how *Struthiomimus* probably behaved when robbing a nest, a reconstruction is given herewith (p. 153).

London, March 1922.

XVI.—*A Case of Secondary Adaptation in a Tortoise.* By Baron FRANCIS NOPCSA, Foreign Corresp. Geol. Soc. London.

IN all tortoises possessing a well-developed plastron and no large mesoplastron, the middle elements—viz., hyoplastron and hypoplastron—are always at least as long as each of the terminal elements—viz., epiplastron (entoplastron) and xiphiplastron. Exceptions are only to be found in the Chelydidæ and Cinosternidæ. Sometimes, especially in primitive Jurassic and Eocene groups (Plesiochelyidæ and Bænidæ), this difference is very marked.

Evidently the great cranio-caudal length of the middle elements of the plastron of tortoises represents the stage of development attained by all tortoises after suppression of the mesoplastron.

It is not without interest to investigate why the Cinosternidæ make an exception to this rule, for within this group the median bony elements of the plastron show a very remarkable shortening. Among the Dermatemyidæ (as defined by Hay), apart from forms provided with a normal well-developed plastron, others also are to be met with where the plastron is more or less reduced (*Agomphus*, *Hoplochelys*, and *Baptemys tricarinata*). In these cases the reduction of the plastron acts in the first instance upon the middle elements, which become shortened to such an extent as to form a sort of cruciform plastron.

A perfectly cruciform plastron is to be met with in the family Chelydridæ and in *Staurotypus*. In these animals the middle elements of the plastron are much shortened on both sides, while the terminal elements (epiplastra and xiphiplastra) show a cranio-caudal stretching, as if their distal parts had been fixed to something that prevented them from yielding to the shortening of the middle region. The shape of such a plastron is very much the same as that of a diamond-shaped piece of indiarubber that has become compressed on either side while it was fixed at its two ends. Since it is a well-known fact that in all primitive tortoises (Amphichelyidæ) and also in the Dermatemyidæ the scapular and pelvic arch adhere more strongly to the distal parts of the plastron than in all the other Cryptodira, this explains the cruciform shape.

I firmly believe that in all these primitive and relatively flat tortoises the scapular and pelvic arches formed internal pillars, whose functions were much the same as the great convexity of the shell in later terrestrial forms—namely, to protect the shell from being crushed.

Siebenrock demonstrated in the 'Sitzungsberichte' of the Vienna Academy in 1907 (pages 537–538) that all the Cinosternidæ with strongly developed plastron (group *C. cruentatum*) originate with Cinosternidæ where the plastron has the shape of a cross (group *C. odoratum*). To support his argument he mentions the existence of an entoplastron in *Staurotypus* and the existence of one or two flexible joints in the plastron of the group *C. cruentatum*. These observations of Siebenrock show in a convincing manner that the enlargement of the plastron in the group *C. cruentatum* is due to a secondary process. The enlargement not being attainable by the growth of the middle elements, which were already undergoing a reduction in the primitive Cinosternidæ, the terminal elements were called upon in the course of evolution. This explains why they attain in the Cinosternidæ such an exceptional size. But not only the development, but also the articulations, in the plastron of the Cinosternidæ differ in regard to their position from the articulation in other forms. In all tortoises where flexibility of the plastron is developed, as in *Sternothœrus*, *Terrapene*, *Cyclemys*, and *Ptychogaster*, the joint is situated on the posterior edge of the hyoplastron, while it is on the median suture of the four terminal elements in the Cinosternidæ.

This detail of minor importance is the reason why in all tortoises, except Cinosternidæ, only one part of the plastron (either the anterior or the posterior) becomes flexible, while in the Cinosternidæ both parts are movable.

The single group of tortoises in which the arrangement of the plastral elements might have permitted a double movement are those with a large mesoplastron (*Sternothœrus*), but here, again, the coalescence of the pelvic girdle with the posterior plastral element prevents such specialization.

A curious trait worth mentioning is the fact that in all Cinosternidæ the development of the dermal scutes is in no way affected by the change in the underlying bones—so that in this group the dermal elements evidently represent conservative parts of the body.

XVII.—*Fossil Arthropods in the British Museum.*—VIII. *Homoptera from Gurnet Bay, Isle of Wight.* By T. D. A. Cockerell, University of Colorado.

In 'Annals Entomological Society of America,' 1917, p. 13, I estimated that the collections from the Oligocene of Gurnet Bay would yield at least 200 species. At the present moment, if we include the three species described below, the list stands at 154. Perhaps half-a-dozen others have been described and await publication. Having worked over the collections at the British Museum, including those sent by Mr. Hooley, I can affirm that the number of species will considerably